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ABSTRACT

A path analytic study examined the effects of career decision-making self-efficacy on the retention of underprepared adults in postsecondary education. The initial sample consisted of 418 underprepared students enrolled in the developmental education unit of a large midwestern urban university who had been subjects of a 1991 study and who represented a 61.7% response rate. Of those students, 398 completed the Career Decision-Making Self-Efficacy (CDMSE) scale and the Fox (1986) revision of the Pascarella and Terenzini Institutional Integration Scale (IIS) and were then randomly separated into 2 groups. A principal components analysis was performed with each group for two subsets of items from the IIS thought to measure students' commitment to the institution and to obtaining a degree and integration into college and 50 items from the CDMSE survey. A model was developed to describe the role of the following variables in student persistence: intention to persist, cumulative grade-point average, academic integration, social integration, goal commitment, and degree utility. It was concluded that those nontraditional students who believe college will give them opportunities for employment and better careers are most likely to persist in postsecondary education. (Contains 49 references.) (MN)

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Effects of Career-Decision-Making Self-Efficacy on the Retention of Underprepared Adults: A Path Analytic Study of Student Persistence

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Effects of Career-Decision-Making Self-Efficacy on the Retention of Underprepared Adults: A Path Analytic Study of Student Persistence

Student retention, the degree to which students persist in or depart from their educational institution, is a concern given high attrition rates in many educational systems. While not all who enter postsecondary educational institutions seek to complete a program or degree, for those who do, the statistics are telling. In the United States, approximately 42% of students enrolled in community colleges and 46% of those enrolled in technical colleges will leave prior to program completion and will not pursue further education (Schwartz, 1990a). Of degree granting institutions, the national stopout rate between the first and sophomore year is highest (47.7%) for two-year public institutions (The Condition of Education, 1995). Only 14% of those who transfer to four-year institutions and 6% of those who stopout but return will eventually earn four-year degrees (Tinto, 1987). Learners, including adult learners, who are underprepared are at risk of attrition, i.e., leaving the institution prior to completing their courses, programs, or degrees. Underprepared students are those who enter postsecondary educational institutions lacking or with underdeveloped skills in reading, writing, or math. These students differ from traditional college populations not only in preparedness, but also in age, enrollment patterns, and previous college experience.

The landscape of postsecondary and higher education is changing. The change, in part, reflects the changing needs of adult learners, often referred to as "non-traditional" learners who comprise a large percentage of enrollment in four-year institutions as well as in community and technical colleges. However, according to the U.S. Department of Education, adults in postsecondary and higher education are no longer "non-traditional" (The Condition of Education, 1995). Rather, adult learners are rapidly becoming the norm. Over 25% of undergraduate postsecondary students are age 30 or older. Between 1980 and 1990, participation in postsecondary education of those under the age of 25 increased 3% and is projected to increase 6% between 1990 and 1998; in contrast, participation of those over age 25 increased 34% between

1980 and 1990 and is expected to increase 14% by 1998. Part-time enrollments increased 28% between 1984 and 1994, while full-time enrollment increased only 14%. These data suggest the need for addressing persistence within the context of the changing landscape of postsecondary education, a landscape that includes adult learners.

Andragogy refers to a set of assumptions and methods that pertain to *adult* learning. According to an andragogical perspective, adult learners tend to have rich backgrounds and experiences which serve as frames of reference for their learning, prefer to be actively involved in their learning, participate in educational experiences that address specific problems or needs (particularly those that are career related), are motivated to learn when they perceive an immediate or practical application (particularly getting a job or advancing in their career), and are increasingly self-directed (Knowles, 1990). A career focus is often the motivation that leads adult learners to the post-secondary and higher educational setting. Yet, many learners lack confidence in their ability to seek information about career decision-making. Career decision-making self-efficacy identifies students' confidence (self-efficacy) in their ability to engage in educational and occupational planning and decision-making.

Working within the framework of the Tinto (1975, 1987) theoretical model of institutional departure, Peterson (1993a) found that of all the background characteristics, only career decision-making self-efficacy contributed to the variance in the social and academic integration of underprepared students. Students who identify with their educational institutions are integrated into the academic and social network, and it is social and academic integration that has the most influence on student retention (Pascarella, Duby, & Iverson, 1983; Pascarella & Terenzini, 1980, 1983, 1991; Schwartz, 1990a; Tinto, 1987. 1994). In addition, the relationship between career decision-making self-efficacy and integration has been found to vary with respect to background characteristics such as ethnicity, age, and registration patterns (Peterson, 1993b). Studies have shown that social and academic integration and persistence may be mediated by other variables as well, including various background characteristics (Munro, 1981; Pascarella & Chapman, 1983; Pascarella, Duby, & Iverson, 1983; Pascarella & Terenzini, 1980, 1983; Schwartz, 1990a;

Weidman, 1984). Those variations hold true for underprepared as well as non-traditional students (Bean & Metzner, 1985; Fox, 1986; Peterson, 1993b; Weidman, 1985). Further, research has shown that adult learners need to "integrate" their educational experience with a broad range of concurrent responsibilities, referred to as extra-institutional integration (Schwartz, 1990a, 1990b).

Given the importance of career relatedness to the education of adults, and acknowledging the relationship between career decision-making self-efficacy and both social and academic integration, the purpose of this study was to explore whether or not a causal relationship exists between career decision-making self-efficacy and persistence. If such a causal linkage exists, a theoretical foundation will have been established for the development, design, and delivery of classroom and non-classroom interventions to increase career decision-making self-efficacy, and therefore improve student retention. Thus the research question was, "Can a path model be constructed that maps the effect of career decision-making self-efficacy on persistence?"

Career Decision-Making Self-Efficacy

Following the successful application of Bandura's (1977) theory of self-efficacy to the treatment of career indecision (Betz & Hackett, 1981; Hackett & Betz, 1981), Taylor and Betz (1983) developed a 50-item Career Decision-Making Self-Efficacy Scale (CDMSE). The scale identifies the extent to which students have confidence in their ability to engage in occupational and educational planning and decision-making, and was concluded to be representative of a rather large general factor given that most items had significant loadings on more than one factor.

Previous research on the CDMSE has produced mixed results, but the general conclusion has been that the 50 items measure one general factor or scale (Blustein, 1989; Shelton, 1990; Taylor & Betz, 1983; Taylor & Popma, 1990), while other research supports the position that self-efficacy is task-specific (Bandura, 1977) as in mathematics or career adjustment (Betz & Hackett, 1981, 1986). According to Shelton (1990), an individual's performance is affected both by specific and general self-efficacy in the following way: General self-efficacy influences an individual's specific self-efficacy regarding a specific task, but the result of this specific experience

provides positive or negative reinforcement or feedback to the individual's general self-efficacy; thus general self-efficacy apparently influences and is influenced by specific self-efficacy.

In general, research has provided support for the validity of the CDMSE instrument (Betz & Hackett, 1986; Robbins, 1985; Taylor & Popma, 1990), and the concept has been widely adapted (Brown, Lent, & Larkin, 1989; Lent, Brown, & Larkin, 1984, 1986, 1987; Lent, Larkin, & Brown, 1989; Nevill & Schlecker, 1988; Peterson, 1993a, 1993b; Rotberg, Brown, & Ware, 1987; Shelton, 1990; Stumpf & Brief, 1987). In addition, a meta-analytic investigation across a wide range of subjects, experimental designs, and assessment methods, reports a positive and statistically significant relationship between self-efficacy beliefs and academic performance and persistence (Multon, Brown, & Lent, 1991).

Method

A progressive series of principal components analyses were performed to identify indicators of latent variables in a causal model. A causal model which related the variables to persistence behavior was constructed and tested using structural equations modeling.

Sample

The initial sample consisted of 418 underprepared students enrolled in the developmental education unit of a large midwestern urban land-grant research university who were subjects in the Peterson (1993a, 1993b) study. The 418 respondents to the mail survey administered during winter term, 1991, represented a 61.7% response rate. Self-reported background characteristics were collected by questionnaire, while other information was obtained from college records. Of the 418 students, 398 who had valid information on all variables used to measure latent variables were used in the path analysis.

The underpreparedness of the sample is reflected by their high school grade point average (GPA) and their high school rank, neither of which is required for admission to the developmental unit of the university. High school GPA was missing for 46% of the respondents; 21.8% had a

GPA below 2.00; the mean GPA was 2.04. High school rank was missing for 25% of the respondents, 58.1% ranked below the 50th percentile, and the mean rank was 37.3.

Some of the demographics, including missing data for high school rank and GPA, suggest that adult learners were well represented in the sample. The respondents, representative of the overall population of the college from which the sample was drawn, were 47.7% male and 52.3% female; they ranged in age from 18 to 48, with 41.9% age 19-20, 27.3% age 21-23, and 23.4% age 24 and older; 70.3% were Caucasian, 12.6% were African American, 7.6% were Asian, 5.0% were Native American, and 4.5% were Hispanic; 69.2% were employed and 47.0% worked 16 hours per week or more.

Instrumentation

Two instruments were administered: the Career Decision-Making Self-Efficacy scale (CDMSE) developed by Taylor and Betz (1983) and the Fox (1986) revision of the Pascarella and Terenzini (1980, 1983) Institutional Integration Scale (IIS), which also incorporated students' initial goals and commitments. High internal consistency reliability (Cronbach's alpha = .97) was reported for the CDMSE instrument in both the Taylor & Betz (1983) study and the Peterson (1993a) study. Moderate to high reliability coefficients also were obtained for the IIS: Overall integration (.91), social integration (.83), academic integration (.88), and initial goals and commitments (.73).

Procedure

Principal components analysis using SPSS (1988) was used to identify variables with the highest loadings on each of the hypothesized latent variables. A separate principal components analysis was performed on three separate subsets of survey items: 1) eleven items from the IIS survey thought to measure students commitment to the institution and to obtaining a degree, 2) 24 items from the IIS survey thought to measure students' integration into college, and 3) the 50 items from the CDMSE survey. Four methods were used to identify the number of components among

each subset of survey items: the scree test (Cattell, 1966; Cattell and Vogelmann, 1977), discontinuity analysis (Coovert and McNelis, 1988), s-index analysis (Cattell, Balcar, Horn, and Nesselroade, 1969; Walkey and McCormick, 1985), and parallel analysis (Horn, 1965; Allen and Hubbard, 1986).

The 398 subjects were randomly separated into two groups and principle components analysis was performed with each group on each of the three subsets of items. Each group was compared on each of the four methods used to determine the number of components. After the number of components had been decided upon for each subset of survey items, principle components analysis with varimax rotation was performed using the entire sample.

Path analysis was conducted using EQS (Bentler, 1995). The three items with the highest loadings identified for each component were used to identify each latent variable, with the exception of three latent variables: Persistence, Intent to Persist, and Academic Performance. Persistence and Academic Performance were treated as directly observed variables represented in the model by their respective measures, while Intent to Persist was represented as a latent variable and identified by a single measure.

Statistical tests were run on the results of the initial model to determine path modifications that might increase the fit of the model. Results from a Lagrange Multiplier (LM) test were used to identify fixed paths that might be released in order to better specify the model. Results from a Wald test were used to identify statistically nonsignificant paths in a model. Several goodness of fit indices computed by the EQS program were used to judge whether or not changes to the initial model represented improvements: the Bentler-Bonnet Normed Fit Index (NFI), the Comparative Fit Index (CFI), the mean absolute standardized residual (MSR), the mean off-diagonal absolute standardized residual (MSR/OD), and the c^2 for the model being tested. The distribution of standardized residuals were also inspected to see if they were symmetric and centered around zero.

Variables in the Study

Persistence was measured as the total number of quarters registered at the university for six terms after the term in which survey information was obtained. Academic Performance was measured by each student's cumulative GPA at the end of the academic year in which the surveys were administered. Table 1 presents a list of the survey items used to measure each of the remaining latent variables.

Principal components analysis was used to identify the items with the highest loadings on the Social Integration and Academic Integration scales, both of which were based on a 5-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5). Social integration reflects students' relationships with their peers and also their perceptions of their non-classroom personal relationships with faculty. Academic integration reflects students' perceptions of the quality of their faculty, classroom teaching, and facilities, and also takes into account out-of-classroom contact with faculty as that contact relates to academic or course related information.

For the eleven items related to students' initial commitment to college, s-index analysis and parallel analysis both suggested one component in both samples, while discontinuity analysis and the scree test identified three components. Because previous models have identified two types of commitment (Goal Commitment and Institutional Commitment), it was decided to extract two components. The first component, labeled Goal Commitment, represents a student's certainty in choice of major, career, and college. The second component, labeled Degree Utility, appears to represent a student's belief that graduating from college is helpful in securing future employment.

The Career Decision-Making Self-Efficacy Scale (CDMSE) consists of 50 items each measured on a 10-point scale (0 = No Confidence, 9 = Complete Confidence) that identify the extent to which students feel confident (have self-efficacy) about their ability to engage in educational and occupational information-gathering and goal-planning activities. In factor analytic studies of the CDMSE scale in which a single general factor is identified, samples have typically comprised traditional college freshmen enrolled in an introductory psychology course (Taylor & Betz, 1983; Taylor & Popma, 1990). Because the sample in the present study represented a

Table 1

Variables in the Model and Items used to Measure each Variable.

Persistence. Total quarters registered at the University; maximum of six quarters

Intent to Persist. Measured by a single item, "I expect to be enrolled at this university one year from today."

Academic Performance. Cumulative GPA at the end of the academic year.

Academic Integration. Measured by three items:

I am satisfied with the extent of my intellectual development since enrolling in the College.

My courses this year have been intellectually stimulating.

My interest in ideas and intellectual matters has increased since coming to this college.

Social Integration. Measured by three items:

Since coming to the College, I have developed close personal relationships with other students.

My personal relationships with other students have had a positive influence on my personal growth, attitudes, and values.

My personal relationships with other students have had a positive influence on my intellectual growth and interest in ideas.

Career Decision-Making Self-Efficacy. Measured by two factors of three items each:

Get Information

Ask a faculty member about graduate schools and job opportunities in your major.

Find and use the Placement Office on campus.

Find information about graduate or professional schools.

Make Decisions

Select one major from a list of potential majors you are considering.

Choose a career that will fit your preferred lifestyle.

Choose a major or career that will fit your interests.

Goal Commitment. Measured by three items:

I was certain of what I was going to major in.

I was certain of my career plans.

I was certain that this college was the right choice for me.

Degree Utility. Measured by three items:

It was important for me to graduate from college.

I believed my college education would be highly useful in getting future employment.

I believed my college education would be useful in getting a really good job.

nontraditional population, a principle components analysis of all 50 items was conducted. Application of the scree test to the eigenvalue plots for the two samples of students made it difficult to determine whether a two or three component solution best represents the component structure of CDMSE. The results of parallel analysis, discontinuity checks, and inspection of the s-indexes all suggest that CDMSE is best represented by two component structure among nontraditional and underprepared students. Thus it was decided to extract two components with varimax rotation for the CDMSE items. The first component, labeled Get Information, represented students' confidence in their ability to gather information that could be used to make a career decision. The second component, labeled Decision Making, represented students' belief in their ability to make career choices and decisions.

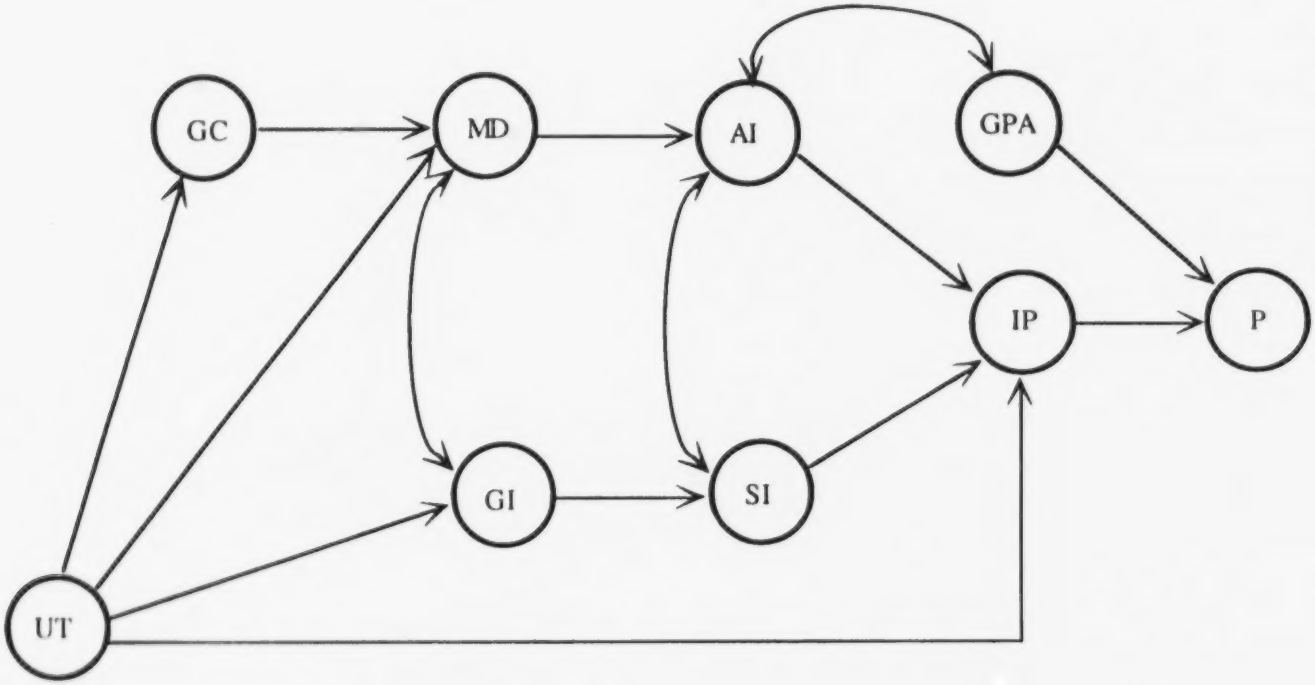
The Model

The Tinto (1987) theoretical model was the foundation for hypothesizing how the two measures of CDMSE might relate to students' commitment and integration in predicting student persistence. Correlations among scale scores derived for each latent variable were also used to identify plausible paths and relationships among the latent variables. In addition to variables typically found in the Tinto model, Academic Performance has been found in more recent path analytic studies to make a large and significant contribution in the prediction of student persistence (Cabrera, Castaneda, Nora, & Hengstler, 1992; Cabrera, Nora, & Castaneda, 1993). Figure 1 represents the initial model tested in the current study.

Students were asked in the IIS survey to indicate their commitment to college and obtaining a degree *at the time they entered* the institution (*initial* goals and commitments). Because students were asked their perceptions regarding their *current* integration into college and their *current* level of career decision-making self- efficacy, latent variables representing these constructs were placed downstream from the two commitment variables. The model hypothesizes that prior commitment moderates students current self-efficacy, which in turn has an effect on students' social and

Figure 1

Initial Causal Path Model for the Relationship of Student Committment, Integration, and Self-Efficacy to Persistence



P = Persistence	GC = Goal Committment	Direct Path
IP = Intention to Persist	UT = Degree Utility	Correlation
GPA = Cumulative GPA	GI = Get Information (CDMSE)	
AI = Academic Integration	MD = Make Decisions (CDMSE)	
SI = Social Integration		

academic integration. In addition to its effect on integration, Degree Utility was hypothesized to have a direct influence on Intent to Persist for this group of underprepared students.

Previous research has found mixed results for the relationship between the two integration measures and persistence behavior. Pascarella and Terenzini (1983) and Pascarella, Duby, and Iverson (1983) found evidence for a direct path from social integration to persistence even in models where current goal and institutional commitment were measured. Models developed by Cabrera et al. (1992, 1993) support the idea that social integration has an indirect influence on persistence behavior that is mediated by institutional commitment. On the other hand, research by Braxton, Duster, and Pascarella (1988) and by Munro (1981) found no evidence for either a direct or indirect influence of social integration on persistence behavior. Donovan (1984) dropped social integration from a causal model when evidence suggested that it was not causally related to prior variables in a model developed from a sample of low-income black college students drawn from multiple institutions.

In the current study it was decided to set a direct path from social integration to persistence behavior in the initial model and to test the significance of the path's coefficient. Because studies have typically found statistically significant direct or indirect effects of academic integration on persistence behavior, in the initial model academic integration was also set with a direct path to persistence behavior. Similar to the Cabrera et al. (1993) model, a correlation between Academic Integration and Academic Performance and a direct path from Academic Performance to Persistence were hypothesized. As in previous models, Intent to Persist was hypothesized to have a direct effect on Persistence.

Results

Three models were tested. Table 2 presents the statistics used in to compare the three models. The initial model (Model 1) accounted for 26% of the variance in Persistence, but it was found to be misspecified. Inspection of the distribution of standardized residuals indicated a positively

skewed distribution that was centered slightly above zero with 81 percent of the values between -0.1 and 0.1. Results of the Wald Test found the path from Social Integration to Intent to Persist not to be statistically significant. Based on this finding a second model (Model 2) was proposed that removed the path from Social Integration to Intent to Persist which left Social Integration "hanging" with respect to the determination of persistence behavior. The correlation between Social Integration and Academic Integration was found to be statistically significant. Model 1 was further modified by dropping the correlation between Social Integration to Academic Integration and replacing it with a direct path going from Social Integration to Academic Integration. No other changes were made to produce Model 2.

Table 2

Comparisons across Models

	R^2 Intent	NFI	CFI	MSR	MSR/OD	c^2	*df*	Dc^2	p-value
Model 1	.264	.889	.936	.057	.062	389.25	177	----	----
Model 2	.264	.891	.938	.053	.057	382.46	178	6.79	< .05
Model 3	.266	.894	.941	.046	.050	370.10	177	12.36	< .05

Results for Model 2 indicated a better fit. While the percent of variance accounted for in persistence behavior remained the same, the change in χ^2 was statistically significant at the α = .05 level. The NFI and CFI fit indices were higher for Model 2 when compared to Model 1, while the MSR and MSR/OD decreased. The distribution of standardized residuals still appeared to be positively skewed although more centered at zero (85 percent of the values between -0.1 and 0.1). The Wald Test did not identify any of the paths in Model 2 as nonsignificant. The LM Test indicated that freeing the path from Degree Utility to Social Integration would increase the fit of the model. A path was set from Degree Utility to Social Integration to produce Model 3.

Results from the analysis of Model 3 indicated a slight increase in the percent of variance accounted for in persistence behavior (27%) as well as a statistically significant change in χ^2. Both fit indices were higher when compared to those of Model 2 and both the MSR and MSR/OD had decreased. The distribution of standardized residuals still appeared to have a positive skew, although less so than in the previous models with 89 percent of the values between -0.1 and 0.1. All paths in the model were statistically significant according to the result of the Wald Test and the LM Test did not identify any paths that might be freed to produce a better fit. No further modifications were made to Model 3.

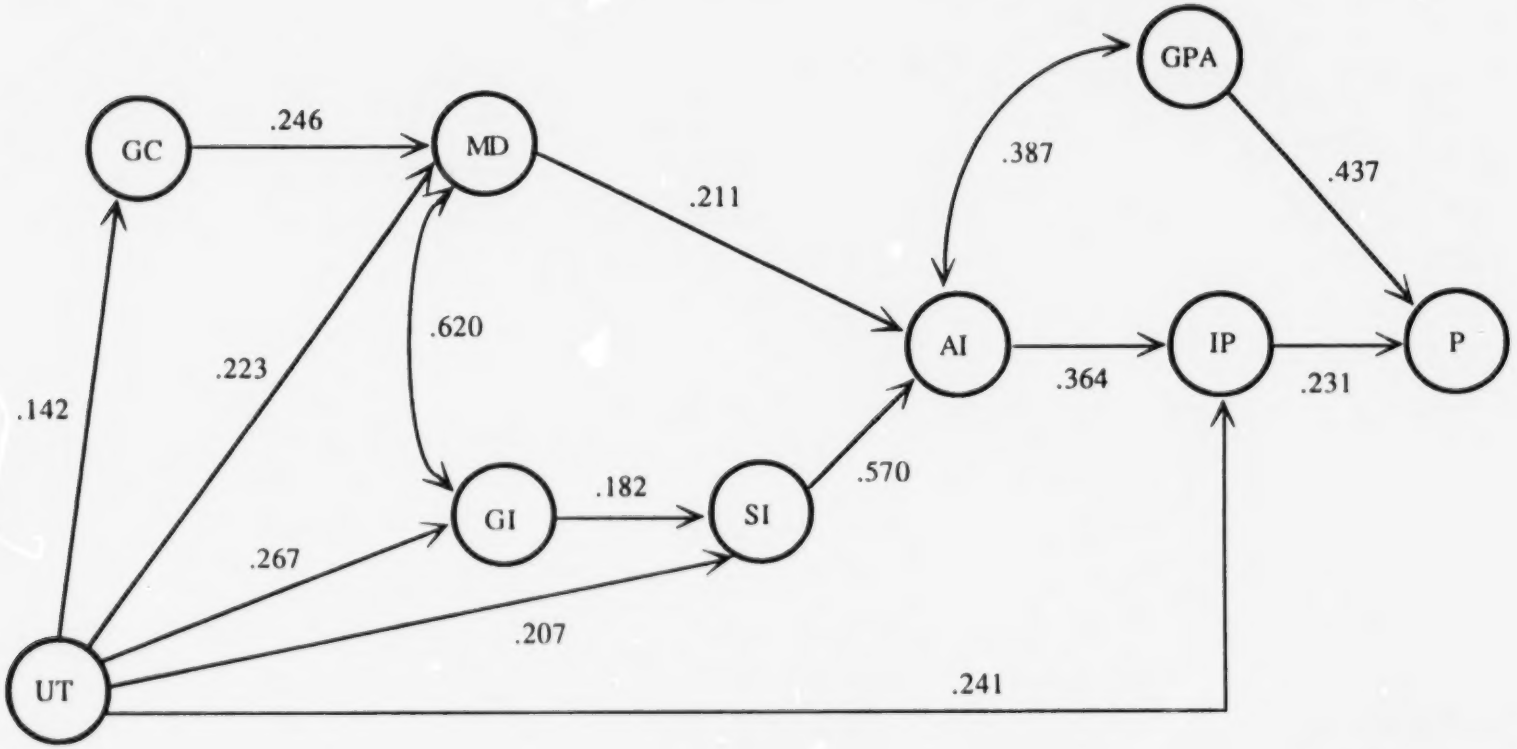
Figure 2 presents the structural model and path coefficients for the final model. The model accounted for 27 percent of the variance in persistence and 21 percent of the variance in Intent to Persist. Inspection of total effects (Table 3) indicates that Academic Performance and Intent to Persist make the largest contributions to student persistence. Intent to Persist is most influenced by Academic Integration, Degree Utility, and Social Integration. Social Integration has a relatively strong influence on Academic Integration in the final model, followed by CDMSE: Get Information, Degree Utility, and CDMSE: Make Decisions. Goal Commitment has a relatively minor influence on Persistence, Intent to Persist, and Academic Integration.

Table 3
Total Effects on Persistence and Intent to Persist

	Persistence Behavior	Intent to Persist	Academic Integration
Intent to Persist	.231	.000	.000
Academic Performance	.437	.000	.000
Academic Integration	.080	.346	.000
Social Integration	.046	.197	.570
CDMSE: Get Information	.008	.036	.104
CDMSE: Make Decisions	.017	.073	.211
Goal Commitment	.004	.018	.052
Degree Utility	.072	.310	.200

Figure 2

Standardized Solution for the Final Model.



P = Persistence	GC = Goal Committment	→ Direct Path
IP = Intention to Persist	UT = Degree Utility	↷ Correlation
GPA = Cumulative GPA	GI = Get Information (CDMSE)	
AI = Academic Integration	MD = Make Decisions (CDMSE)	
SI = Social Integration		

Discussion

The final structural model does not account for a large portion of the variance in student persistence, but it does add to the literature on student persistence in several ways. First, the model suggests that Degree Utility plays an important role in determining the persistence behavior of nontraditional, underprepared college students. While Degree Utility did not have a large overall effect on persistence, it did produce a significant influence on two variables that affect persistence, intent to persist, and academic integration. This finding suggests that nontraditional, underprepared students who believe college will provide them opportunities for employment and better careers are more likely to persist. Consistent with the andragogical orientation of adult learners, this finding has implications for admissions and advising adult students. Adults may benefit from career counseling that helps them identify careers that can be pursued through academic coursework or that are likely to result in employment through completion of a course, program, or degree.

Secondly, the model confirms that career decision-making self-efficacy contributes to the academic and social integration of nontraditional, underprepared students. Similar to Degree Utility, CDMSE does not make a direct contribution to persistence, but it does affect academic integration significantly. One component of CDMSE, Make Decisions, has a direct effect on academic integration while the Get Information component has an indirect effect on academic integration through social integration. Knowledge of the ways in which self-efficacy can by acquired (Bandura, 1977) can be applied to develop interventions which may differentially impact student confidence when gathering information and/or making decisions. The implication is that increasing students belief in their ability to gather and act on information related to career decisions produces students who become better integrated into the academic system, which in turn makes them more likely to persist at obtaining their goal whether it be course, program, or degree completion.

Consistent with findings from research with traditional students, this study found academic integration and intention to have a significant influence on persistence behavior for nontraditional, underprepared college students. Results of this study are also consistent with previous findings that suggest social integration does not have a direct influence on persistence behavior. The final model does suggest that students' level of social integration and confidence in their ability to make career related decisions work together to increase students' academic integration, which in turn has a direct effect on students' intention to persist.

This research has extended the Tinto (1987) model of student retention to an underprepared nontraditional population. Additional research needs to be conducted to determine whether the current findings can be replicated with comparable populations and to measure and incorporate variables not traditionally represented in the Tinto (1987) model such as degree utility, CDMSE, and variables identified by others (e.g., Braxton et al., 1988; Cabrera et al., 1993; Donovan, 1984). Additionally, future research might explore the effects of interventions such as career counseling, advising, and mentorships on persistence behavior in order to gain a better understanding of how persistence can be enhanced as well as predicted.

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